Preferentially Cytotoxic to Leukemia and Selected Solid Tumor Cells.

AUTHOR: Sieber Frit. ...print); Daziano Jean-Pierre (Reprint); Anderson
    Gregory S (Reprint); Miyagi Kiyoko (Reprint); Sampson Reynee W (Reprint);
    Tsujino Ichiro (F.. int); Gunther Wolfgang H (Reprint); Krieg Marianne
    (Reprint); Bousha, ...il (Reprint); Forsterling Frank H (Reprint)
AUTHOR ADDRESS: Ped ...i ..., Medical College of Wisconsin, Milwaukee, WI,
    USA**USA

ABSTRACT: Selenium (Se) is an essential trace mineral. Dietary Se
    deficiency has be.. linked to Keshan Disease and an increased incidence
    of cancer and car... ...ular disease. Se compounds have been used in
    preclinical model. and. to a limited extent in the clinic, for the
    treatment of cancer. All biological activities of Se have been attributed
    to ionized or organic Se, i.e. Se in oxidation states -II, +II, +IV, or
    +VI. Elemental Se (Se in oxidation state 0) has been considered
    biologically inert. We report here that Se(0) generated by the singlet
    oxygen-mediated photobleaching of **selenomerocyanine** photosensitizers
    combines with certain serum macromolecules (notably albumin and
    lipoproteins) to form conjugates that are selectively cytotoxic for
    leukemia and selected solid tumor cells. For example, a 1-hour exposure
    to an 8-muM solution of Se-conjugates is sufficient to eliminate 5 log of
    in vitro clonogenic L1210/L-PAM2 leukemia cells while preserving all
    normal granulocyte/macrophage progenitors and CD34-positive cells. In
    some preclinical models, Se-conjugates synergistically potentiate the
    anti-tumor effect of ionizing radiation and alkylating agents. In order
    to express their cytotoxic potential, Se-conjugates need to be
    internalized by a. ..:ytotic process that is inhibited by low
    temperature, cytochalasin B, and excess native carrier protein. However,
    the protein and lipoprotein content of whole blood is not sufficient to
    block the selective uptake of conjugates by leukemia cells.
    Internalization of Se-conjugates is followed by a rapid and massive (up
    to 80%) drop of intracellular glutathione, a loss of mitochondrial
    transmembrane potential, and the activation of caspases. Se conjugates
    that are derived from merocyanines with a S or Se atom in the donor
    heterocycle are green-fluorescent due to the binding of a chromophore
    photoproduct to the carrier molecule. The fluorescent label allows easy
    analysis of the binding/uptake and distribution of Se-conjugates by flow
    cytometry. Our results demonstrate that photoproducts can contribute
    substantially to the cytotoxic action of photodynamic therapy. They offer
    a plausible explanation for the reduced cytotoxic activity of selone
    photosensitizers at low temperatures, and they question the widely held
    view that Se (0) is inert. Compounds modeled after our Se-conjugates may
    prove useful for the local or systemic therapy of cancer.

ORGANISMS: animal (Animalia)
ORGANISMS: PARTS F...: ...rm--blood and lymphatics
COMMON TAXONOMIC ... ...: ...imals
DISEASES: cancer--neoplastic disease, therapy; leukemia--blood and
  lymphatic disease, neoplastic disease
MESH TERMS: Neoplasms (MeSH); Leukemia (MeSH)
CHEMICALS & BIOCHEMICALS: caspase--regulation; cytochalasin B;
  glutathione; selenium--generation
METHODS & EQUIPMENT: photodynamic therapy--clinical techniques,
  therapeutic and prophylactic techniques
MISCELLANEOUS TERM: mitochondrial transmembrane potential; Meeting
  Abstract; Meeting Poster
CONCEPT CODES:
  00520 General biology - Symposia, transactions and proceedings
  10064 Biochemistry studies - Proteins, peptides and amino acids
  10069 Biochemistry studies - Minerals
  10802 Enzymes - General and comparative studies: coenzymes
  12512 Pathology - Therapy
  15002 Blood - Blood and lymph studies
  15004 Blood - Blood cell studies
  15006 Blood - Blood, lymphatic and reticuloendothelial pathologies
  24004 Neoplasms - Pathology, clinical aspects and systemic effects
  24008 Neoplasms - Therapeutic agents and therapy
  24010 Neoplasms - Blood and reticuloendothelial neoplasms
BIOSYSTEMATIC CODES:
  33000 Animalia

 1/9/2   (Item 2 from file: 5)
DIALOG(R)File   5:...s Reviews(R)
(c) 2005 BIOSIS. A...... ....

0012546247   BIOSIS NO.: 2...02-45560
**Albumin uptake defines sensitivity to selenomerocyanine -derived
  photoproduct-albumin adducts**
AUTHOR: Tsujino I Ichiro (Reprint); Bousbaa J; Sieber F (Reprint)
AUTHOR ADDRESS: Med Coll of Wisconsin, Milwaukee, WI, USA**USA
JOURNAL: Proceedings of the American Association for Cancer Research Annual
Meeting (41): p760 March, 2000 2000
MEDIUM: print
CONFERENCE/MEETING: 91st Annual Meeting of the American Association for
Cancer Research. San Francisco, California, USA April 01-05, 2000;
20000401
ISSN: 0197-016X
DOCUMENT TYPE: Meeting; Meeting Poster
RECORD TYPE: Citation
LANGUAGE: English
REGISTRY NUMBERS: 14 30-98-2: cytochalasin B; 70-18-8: glutathione
DESCRIPTORS:
  MAJOR CONCEPTS: Biochemistry and Molecular Biophysics; Pharmacology;
    Tumor Biology
  BIOSYSTEMATIC CODES: Hominidae--Primates, Mammalia, Vertebrata, Chordata,
    Animalia; Muridae--Rodentia, Mammalia, Vertebrata, Chordata, Animalia
  ORGANISMS: H69 cell line (Hominidae)--human small cell lung cancer cells;
    L1210 cell line (Muridae)--murine leukemia cells
  COMMON TAXONOMIC TERM: Humans; Primates; Animals; Chordates; Mammals;
    Nonhuman Vertebrates; Nonhuman Mammals; Rodents; Vertebrates
  CHEMICALS & BIOCHEMICALS: albumin--uptake; cytochalasin B; glutathione
    --intracellular; photoproduct-albumin adducts--antineoplastic activity,

selenomerocyanine -derived
  MISCELLANEOUS TER...:   Meeting Poster; Meeting Poster
CONCEPT CODES:
    24002 Neoplasms - Gen...
    02506 Cytology - Anim...
    10060 Biochemistr. ...s - General
    10502 Biophysic. ...
    16001 Respiratory s...e. - General and methods
    22002 Pharmacolo.j - Gen..al
    15001 Blood - Ge:. .al ar.i methods
    00520 General bic.o.. - .ymposia, transactions and proceedings
BIOSYSTEMATIC CODES:
    86215 Hominidae
    86375 Muridae

  1/9/3   (Item 1 from file: 34)
DIALOG(R)File 34:..i..... .(R) Cited Ref Sci
(c) 2005 Inst for ..i I.. . All rts. reserv.

11737957   Genuine ....: 614.L   Number of References: 0
Title: Colloidal sel..i.m g.nerated by photobleaching of selenomerocyanine
    dyes combines wi.h se..m macromolecules to form conjugates that are
    preferentially .y.tox.c to leukemia and selected solid tumor cells
Author(s): Sieben ?; ..zia.. J?; Anderson GS; Miyagi K; Sampson RW; Tsujino
    L; Gunther W.H; Kri.g M; Bousbaa J; Forsterling FH
Corporate Source: Med Coll Wisconsin,Milwaukee//WI/53226; WHHG Consulting,W
    Chester//PA/; Univ Wisconsin,Milwaukee//WI/53201
Journal: BLOOD, 2002, V100, N11,2 (NOV 16), P224B-224B
ISSN: 0006-4971   Publication date: 20021116
Publisher: AMER SOC HEMATOLOGY, 1900 M STREET. NW SUITE 200, WASHINGTON, DC
    20036 USA
Language: English   Doc...nt Type: MEETING ABSTRACT
Meeting Abstract Number: .ill
Geographic Location: ...
Journal Subject C.t.... ..: .HEMATOLOGY
? s selenoo..nol
      ..   C . .OOX .L
? logoff y
      03mar05 1.:.8:.. Us.-27..53 Session D24.2
            ...20   ..044 .ialUnits File5
              ..... 2 Ty..(s) in Format 9
            $4.0. 2 Types
      $4.26 Estima..d Cost File5
            $0.5.   ..27 .ialUnits File34
              ...... 1 .y..(s) in Format 9
            .6.43 1 Ty...
      $7.02 Estima.. . ... File34
            .0.07   .. .. .ialUnits File35
      $0.07 ..i..+. . . ....:
            .... 2. ..l.its File40
      $0.19 Est.... . st ...ed.
            $0...   ..J18 .ia .;.its File50
      $0.03 .sti.... d ..st .il. . .
            ....)27 .ia.Units File65
      $0.10 .st....-d ..st il..
            .0.0.   . .09 ..ialU.its File71
      $0.07 .sti.... . .st Fil.71
            ..0..   . .?. .ialUnits File73

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$0.28   Estimated cost File73
        $0.08    0.   DialUnits File91
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        $0.03    .    DialUnits File94
$0.09   Estimated cost File94
        $0.02    .    DialUnits File98
$0.02   Estimated cost File98
        $0.15    .27  DialUnits File110
$0.15   Estimated cost File110
        $0.10    .18  DialUnits File135
$0.10   Estimated cost File135
        $0.04    .018 DialUnits File143
$0.04   Estimated cost File143
        $0.14    .    DialUnits File144
$0.14   Estimated cost File144
        $0.06    .    DialUnits File155
$0.06   Estimated cost File155
        $0.06    .    DialUnits File164
$0.06   Estimated cost File164
        $0.03    .    Units File172
$0.28   Estimated cost File172
        $0.16    0.027    Units File185
$0.16   Estimated cost File185
        $0.56    .02  Units File357
$0.56   Estimated cost File357
        $0.09    .    Units File369
$0.09   Estimated cost File369
        $0.09    .    DialUnits File370
$0.09   Estimated cost File370
        $0.    0     DialUnits File391
$0.00   Estimated cost File391
        $0.59    0.     DialUnits File434
$0.59   Estimated cost File434
        $0.06    .     Units File467
$0.06   Estimated cost File467
        One Search, 25  .  , 0.569 DialUnits FileOS
$0.80   TELNET
$15.44  Estimated cost this search
$15.55  Estimated total session cost   0.777 DialUnits


Logoff: level 05.00.1          .    :00


You are now logged off
```

Trying 31060000009999...Open·

DIALOG INFORMATION SERVICES
PLEASE LOGON:
 ******** HHHHHHHH SSSSSSSS? ### Status: Signing onto Dialog ********
ENTER PASSWORD:
 ******** HHHHHHHH SSSSSSSS? ********
Welcome to DIALOG

Status: Login successfulDialog level 05.00.10aD

Last logoff: 01mar05 11:25:06
Logon file405 09mar05 10:55:29
            *** ANNOUNCEMENT ***
                    ***
--Important Notice to Freelance Authors--
See HELP FREELANCE for more information
                    ***
NEW FILES RELEASED
***FDAnews (File 182)
***German Patents Fulltext (File 324)

***Beilstein Abstracts (File 393)
***Beilstein Facts (File 390)
***Beilstein Reactions (File 391)
                    ***
RELOADED
***Medline (Files 154 & 155)

RESUMED UPDATING
***Canadian Business and Current Affairs (262)
                    ***
    >>> Enter BEGIN HOMEBASE for Dialog Announcements <<<
    >>>   of new databases, price changes, etc.   <<<
                    ****
* * *
SYSTEM:HOME
Cost·is in DialUnits
Menu System II: D2 version 1.7.9 term=ASCII
                    *** DIALOG HOMEBASE(SM) Main Menu ***

 Information:
  1. Announcements (new files, reloads, etc.)
  2. Database, Rates, & Command Descriptions
  3. Help in Choosing Databases for Your Topic
  4. Customer Services (telephone assistance, training, seminars, etc.)
  5. Product Descriptions

 Connections:
  6. DIALOG(R) Document Delivery
  7. Data Star(R)

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    /H = Help   /L = Logoff   /NOMENU = Command Mode

Enter an option number to view information or to connect to an online
 service. Enter a BEGIN command plus a file number to search a database
 (e.g., B1 for ERIC).

?
Terminal set to DLINK
                    *** DIALOG HOMEBASE(SM) Main Menu ***

 Information:
  1.   Announcements (new files, reloads, etc.)
  2.   Database, Rates, & Command Descriptions
  3.   Help in Choosing Databases for Your Topic
  4.   Customer Services (telephone assistance, training, seminars, etc.)
  5.   Product Descriptions

 Connections:
  6.   DIALOG(R) Document Delivery
  7.   Data Star(R)

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     /H = Help   /L = Logoff   /NOMENU = Command Mode

Enter an option number to view information or to connect to an online
 service.   Enter a BEGIN command plus a file number to search a database
(e.g., B1 for ERIC).
? LOGOFF

        09mar05 10:56:17 User276653 Session D23.1
              $0.00   0.213 DialUnits FileHomeBase
     $0.00   Estimated cost FileHomeBase
     $0.21   TELNET
     $0.21   Estimated cost this search
     $0.21   Estimated total session cost   0.213 DialUnits

Logoff: level 05.00.10a D   10:56:17

You are now logged offTrying 31060000009999...Open

DIALOG INFORMATION SERVICES
PLEASE LOGON:
 ******** HHHHHHHH SSSSSSSS? ### Status: Signing onto Dialog ********
ENTER PASSWORD:
 ******** HHHHHHHH SSSSSSSS? ********
Status: Login successfulWelcome to DIALOG

Dialog level 05.00.10aD

Last logoff: 09mar05 10:56:17
Logon file405 09mar05 11:04:35
* * *
SYSTEM:HOME
Cost is in DialUnits
Menu System II: D2 version 1.7.9 term=ASCII
                    *** DIALOG HOMEBASE(SM) Main Menu ***

 Information:
  1.   Announcements (new files, reloads, etc.)
  2.   Database, Rates, & Command Descriptions
  3.   Help in Choosing Databases for Your Topic
  4.   Customer Services (telephone assistance, training, seminars, etc.)

5.   Product Descriptions

Connections:
  6.   DIALOG(R) Document Delivery
  7.   Data Star(R)

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     /H = Help   /L = Logoff   /NOMENU = Command Mode

Enter an option number to view information or to connect to an online
 service.   Enter a BEGIN command plus a file number to search a database
(e.g., B1 for ERIC).
?
Terminal set to DLINK
                    *** DIALOG HOMEBASE(SM) Main Menu ***

 Information:
  1.   Announcements (new files, reloads, etc.)
  2.   Database, Rates, & Command Descriptions
  3.   Help in Choosing Databases for Your Topic
  4.   Customer Services (telephone assistance, training, seminars, etc.)
  5.   Product Descriptions

Connections:
  6.   DIALOG(R) Document Delivery
  7.   Data Star(R)

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     /H = Help   /L = Logoff   /NOMENU = Command Mode

Enter an option number to view information or to connect to an online
 service.   Enter a BEGIN command plus a file number to search a database
(e.g., B1 for ERIC).
? b biosci

        09mar05 11:05:03 User276653 Session D24.1
             $0.00   0.207 DialUnits FileHomeBase
      $0.00   Estimated cost FileHomeBase
      $0.11   TELNET
      $0.11   Estimated cost this search
      $0.11   Estimated total session cost   0.207 DialUnits

SYSTEM:OS - DIALOG OneSearch
   File   5:Biosis Previews(R) 1969-2005/Feb W4
          (c) 2005 BIOSIS
   File 34:SciSearch(R) Cited Ref Sci 1990-2005/Feb W4
          (c) 2005 Inst for Sci Info
   File 35:Dissertation Abs Online 1861-2005/Feb
          (c) 2005 ProQuest Info&Learning
   File 40:Enviroline(R) 1975-2005/Feb
   File 50:CAB Abstracts 1972-2005/Feb
          (c) 2005 CAB International
   File 65:Inside Conferences 1993-2005/Mar W1
          (c) 2005 BLDSC all rts. reserv.
   File 71:ELSEVIER BIOBASE 1994-2005/Feb W4

```
              (c) 2005  Elsevier Science B.V.
   File   73:EMBASE 1974-2005/Feb W4
              (c) 2005 Elsevier Science B.V.
   File   91:MANTIS(TM) 1880-2005/Feb
              2001 (c) Action Potential
   File   94:JICST-EPlus 1985-2005/Jan W4
              (c)2005 Japan Science and Tech Corp(JST)
   File   98:General Sci Abs/Full-Text 1984-2004/Dec
              (c) 2005 The HW Wilson Co.
   File  110:WasteInfo 1974-2002/Jul
              (c)  2002 AEA Techn Env.
```
*File 110: This file is closed (no updates)
```
   File  135:NewsRx Weekly Reports 1995-2005/Feb W4
              (c) 2005 NewsRx
```
*File 135: New newsletters are now added. See Help News135 for the
complete list of newsletters.
```
   File  143:Biol. & Agric. Index 1983-2005/Jan
              (c) 2005 The HW Wilson Co
   File  144:Pascal 1973-2005/Feb W4
              (c) 2005 INIST/CNRS
   File  155:MEDLINE(R) 1951-2005/Mar W1
              (c) format only 2005 The Dialog Corp.
```
*File 155: Medline has been reloaded; acession numbers have changed.
Please see HELP NEWS 154.
```
   File  164:Allied & Complementary Medicine 1984-2005/Mar
              (c) 2005 BNHCIS
   File  172:EMBASE Alert 2005/Feb W4
              (c) 2005 Elsevier Science B.V.
   File  185:Zoological Record Online(R) 1978-2005/Mar
              (c) 2005 BIOSIS
   File  357:Derwent Biotech Res. _1982-2005/Mar W2
              (c) 2005 Thomson Derwent & ISI
   File  369:New Scientist 1994-2005/Feb W3
              (c) 2005 Reed Business Information Ltd.
   File  370:Science 1996-1999/Jul W3
              (c) 1999 AAAS
```
*File 370: This file is closed (no updates). Use File 47 for more current
information.
```
   File  391:Beilstein Reactions  Nov. 2004
              (c) 2005 Beilstein GmbH
   File  434:SciSearch  Cited Ref Sci 1974-1989/Dec
              (c) 1998 Inst for Sci Info
   File  467:ExtraMED(tm) 2000/Dec
              (c) 2001 Informania Ltd.
```
*File 467: F467 no longer updates; see Help News467.   **7.**

```
       Set   Items  Description
       ---   -----  -----------
? s selenomerocyanin
     S1       3   SELENOMEROCYANINE
? t s1/9/all


 1/9/1     (Item 1 from file: 5)
DIALOG(R)File   5:Files Preview(R)
(c) 2005 BIOSIS. All rts. reserv.

0014409176    BIOSIS No.: 200300367895
```
Colloidal Selenium   Generated by Photobleaching of Selenomerocyanine Dyes
   Combines with Serum Macromolecules To Form Conjugates That Are